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Epidemic Anterior Poliomyelitis
(Infantile Paralysis)

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"Public health is purchasable. Within natural limitations a community can determine its own death rate."

This Bulletin will be mailed to any person in Montana upon request, mailed to the Secretary of the State Board of Health at Helena.

EPIDEMIC ANTERIOR POLIOMYELITIS

(Infantile Paralysis)

Anterior Poliomyelitis is an acute infectious disease which may, but usually does not, result in paralysis.

History.

So far as is known at the present time poliomyelitis is a disease of comparatively recent origin. The first mention of the disease was by Michael Underwood in 1784, who describes it in his treatise on the Diseases of Children as "debility of the lower extremities." In 1816 the German physician, Jorg, described a case and in 1836 the English physician, Badham, observed several cases. Occasional cases were recorded from time to time until in 1868 Bull of Sweden reported an epidemic affecting fourteen persons. Bergenholtz of Sweden in 1881 first recognized the disease as of an acute infectious character. Since then epidemics have been reported all over the world. There occurred a severe epidemic in Scandinavia in 1905, and it is only since that time that much attention has been given to the disease in this country.

An epidemic occurred in New York in 1907, but was not recognized as such until the large number of paralytic cases seeking help at dispensaries led to an investigation of the cause. While 800 persons were actually proved to have had the disease in this epidemic, it was estimated by the investigating committee that at least 2500 cases had occurred in New York City. The disease occurred only sporadically from 1907 to 1916. During the latter year the great epidemic in New York occurred. From June 1 to November 1, 1916, some 8928 cases of poliomyelitis were reported with 2407 deaths, the largest epidemic with the greatest fatality rate ever recorded.

In the summer of 1908 there occurred an extensive epidemic in Wisconsin and it spread in the two succeeding years to Minnesota, Iowa and Nebraska. The first cases recorded in Montana occurred in 1910.

INFANTILE PARALYSIS IN MONTANA.

The following table gives a statistical summary of the incidence of poliomyelitis in Montana since 1916:

Year	No. Cases Reported	Morbidity Rate per 100,000 Population	No. Deaths Reported	Mortality or Death Rate per 100,000 Pop.
1916	111	34.2	24	5.2
1917	37	7.8	8	1.6
1918	8	1.6	7	1.3
1919	9	1.8	3	.6
1920	27	4.8	5	.9
1921	26	4.5	3	.5
1922	49	8.3	7	1.2
1923	16	2.9	5	.9
1924	182	32.75	23	4.13

The years 1916 and 1924 were epidemic years for the disease in this state. During the intervening years the cases were sporadic and with no apparent focus of the infection. In 1916 there were reported 111 cases and 24 deaths. These cases were reported from twelve counties, but there was a distinct outbreak in Billings and Yellowstone county and extending to the adjoining counties. In 1924 there were 182 cases reported with 23 deaths. Two distinct epidemics occurred; one in Garfield county in July and one in the western part of the state in Missoula, Ravalli and Lake counties during August and September. The latter epidemic started during vacation time but the schools were opened as soon after the regular time as the health authorities became organized to handle the epidemic. Results justified this action as there was no flare-up of the disease following the opening of schools.

Cause of Poliomyelitis.

Although no organism has been proved to be the cause of the disease it may be said with certainty at the present time that the disease is due to a living filterable virus. By "virus" we mean an animal poison produced by and capable of transmitting disease, and by "filterable" we mean that it will pass through the pores of a porcelain filter. In 1909 Popper and Landsteiner, and later in the same year, Lewis and Flexner demonstrated that the virus was present in the spinal cord of a child dead from the disease. In this same year Flexner and his coworkers succeeded in reproducing the disease in monkeys.

Transmission.

The following facts are known about the transmission of the disease. The virus has been recovered from the throat and nose and the intestines of persons suffering from the poliomyelitis and who have had typical paralytic symptoms; it has also been found in similar places in persons without paralysis but suspected of having been infected because of contact with known cases, and from healthy attendants upon cases. All our available evidence indicates that the disease is not spread by animals, but that it is largely spread by unrecognized human carriers. The virus has also been recovered from handkerchiefs used by patients and has been demonstrated in dust collected from the room where cases were isolated.

It is evident then that human carriers are to blame for transmission of the disease so far as our present knowledge goes and that dust and filth play a part also as sources of infection.

Signs and Symptoms.

Poliomyelitis is like all other acute infectious diseases which have epidemic tendencies and is not as so many persons think, a disease of the nervous system. Probably 85% of all cases of the disease never develop any paralysis, and therefore the symp-

toms of a majority of the cases are those of an acute general infection. Unfortunately since the general symptoms resemble those of other infections of childhood, probably a large number of cases escape detection, particularly in the absence of an epidemic. These unrecognized cases harbor the virus just the same as the easily recognized paralytic cases and are doubtless one of the chief sources of infection in a community. The onset of the disease is accompanied by fever (usually not above 103°) and an alternating sleepiness and irritability. The one characteristic feature is the peculiar expression in the eyes which is difficult to describe but is rather one of apprehension. These symptoms may continue for a day or two and then disappear if the case is a mild one. In more severe cases the child may have severe headache and other symptoms of meningeal involvement. In paralytic cases there may be muscular pain and tenderness; muscular weakness is most marked.

Paralysis usually occurs on the second day and if the respiratory muscles are involved this usually occurs on the fourth or fifth day. The initial paralysis is usually as far as the involvement goes. At this point it must be urged that all cases be under the care of a competent physician. Parents are always most anxious to have something done for the paralysis but at this stage the most important thing is absolute rest for the paralyzed muscles. Massage or any manipulation at this stage will prove disastrous to recovery and the necessary rest can only be directed by a physician.

Treatment.

Two different methods have been used to give a specific treatment. The serum of convalescent or recovered cases has been used rather extensively. This apparently has some value but it is necessary to use large amounts and that within the first few hours of the disease. Rosenow of Rochester has evolved a serum produced from horses injected with a streptococcus isolated from the spinal cords of fatal poliomyelitis cases. This has been used in Montana in the epidemic of 1924, and physicians have reported favorable results from its use.

The only other treatment is symptomatic. We feel that we must again state the necessity of having a competent physician in attendance as during the acute stages of the disease much harm may be done by inexpert attention.

After the acute stage is passed and sufficient time has elapsed in the paralytic cases so that no further involvement is to be feared, re-education of the paralyzed muscles is to be undertaken. This work also should be under the guidance of a physician trained in this work. Montana has made special provision for the care of indigent crippled children and as a large percentage of these are due to poliomyelitis, a brief account of the Montana Orthopedic Commission is appended. According to a recent bulletin, South Dakota estimates that 42%

of the cases of indigent crippled children reported to the board of health are due to infantile paralysis. Undoubtedly because of our epidemics of 1916 and 1924 the percentage would be even higher in Montana.

Control Measures for Prevention of Poliomyelitis.

Poliomyelitis is a reportable disease in Montana. Every case should be promptly reported to the health authorities as soon as diagnosed or even suspected. The strictest isolation and quarantine measures must prevail. The State Board of Health regulations for poliomyelitis are contained in bulletin No. 21. The general measures to be observed during an outbreak of poliomyelitis are as follows:

Parents should not permit their children to go near infected areas at any time nor should they go there themselves.

Contact with persons coming from infected areas should always be avoided.

Parents should not allow any one to kiss their children including themselves.

As far as practicable, all large gatherings and all public meetings should be avoided.

Personal cleanliness is necessary. The hands should be washed always before eating and always after coming from the toilet.

Children should be taught to keep their fingers and all objects out of their mouths and nostrils and should use a handkerchief to cough or sneeze into.

The use of all common utensils, including towels and drinking cups, should be avoided. The home should be kept scrupulously clean and free from dust. The latter should always be removed by damp cloths and should never be swept up with a dry broom so that the air becomes filled with it. The house should also be kept free of insects.

THE MONTANA ORTHOPEDIC COMMISSION.

The orthopedic commission was created by the seventeenth legislative assembly in 1921. The commission is composed of the secretary of the State Board of Health, the president of the Montana State Medical Society, and three members appointed by the governor. An appropriation of $25,000 was made for the work of the commission and the eighteenth assembly appropriated $25,000 again. During the first biennium 93 cases were treated under the direction of the commission and during the second biennium 90 cases received treatment, a total of 183 cases.

The commission cares for indigent crippled children no matter what the cause. In general no cases are undertaken unless the physicians see the possibility of cure or of marked improvement.

Three centers were created for the work, Lewistown, Great Falls and Billings. Orthopedic surgeons at these centers were appointed by the State Medical Society to conduct this work, and cases are sent to the center nearest to their homes.

Information concerning treatment or aid may be obtained from the local or county health officers.